

ICT in Education: Issues & Questions

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Outline

- I. Introduction
- II. Key Policy Questions
- III. UNESCO's Work
- IV. The Way Forward

I. Introduction

What do we mean by ICT in education?

- Definition of ICT in Education
 - Comprehensive approach to innovate education systems, methods, and management through Information Communications Technology
 - Restructuring education system
 - Diversifying teaching-learning methods & practices
 - Engaging all stakeholders of education and adapting rapid to changes in society and the environment
 - Enhancing education efficiency, effectiveness, and productivity

What do we mean by ICT in education?

- Scope of ICT in Education
 - ICT as a subject (i.e. computer studies)
 - ICT as a tool to innovate teaching-learning practice (i.e. digital content, multimedia, teaching-learning methods, learning environment)
 - ICT as an administrative tool (i.e. education management information systems (EMIS))
 - ICT as an expanding learning opportunity (i.e. distance learning, e-Learning)
 - ICT as a facilitator of higher-order thinking skills (i.e. learner-centered, self-directed learning, tailored learning)

What does ICT mean to individuals and society?

- ICT and the world of work
- ICT and skill/wage premium
- ICT and employment
- ICT as a source of economic growth

ICT and the world of work

Computerization and job task content within occupations

	1977	1984	1991	Examples
Complex Communication	2.94	3.57	4.02	Eliciting critical information and conveying a convincing interpretation of it to others
Expert Thinking	5.70	5.86	7.08	Identifying and solving new problems
Routine Cognitive	-18.18	-16.56	-18.48	Filing, Bookkeeping
Routine Manual	1.74	0.83	0.37	Assembly line work

(Values are OLS regression of ten times annual change in the occupational task measure)

Source: Murnane, et. al. (2003)

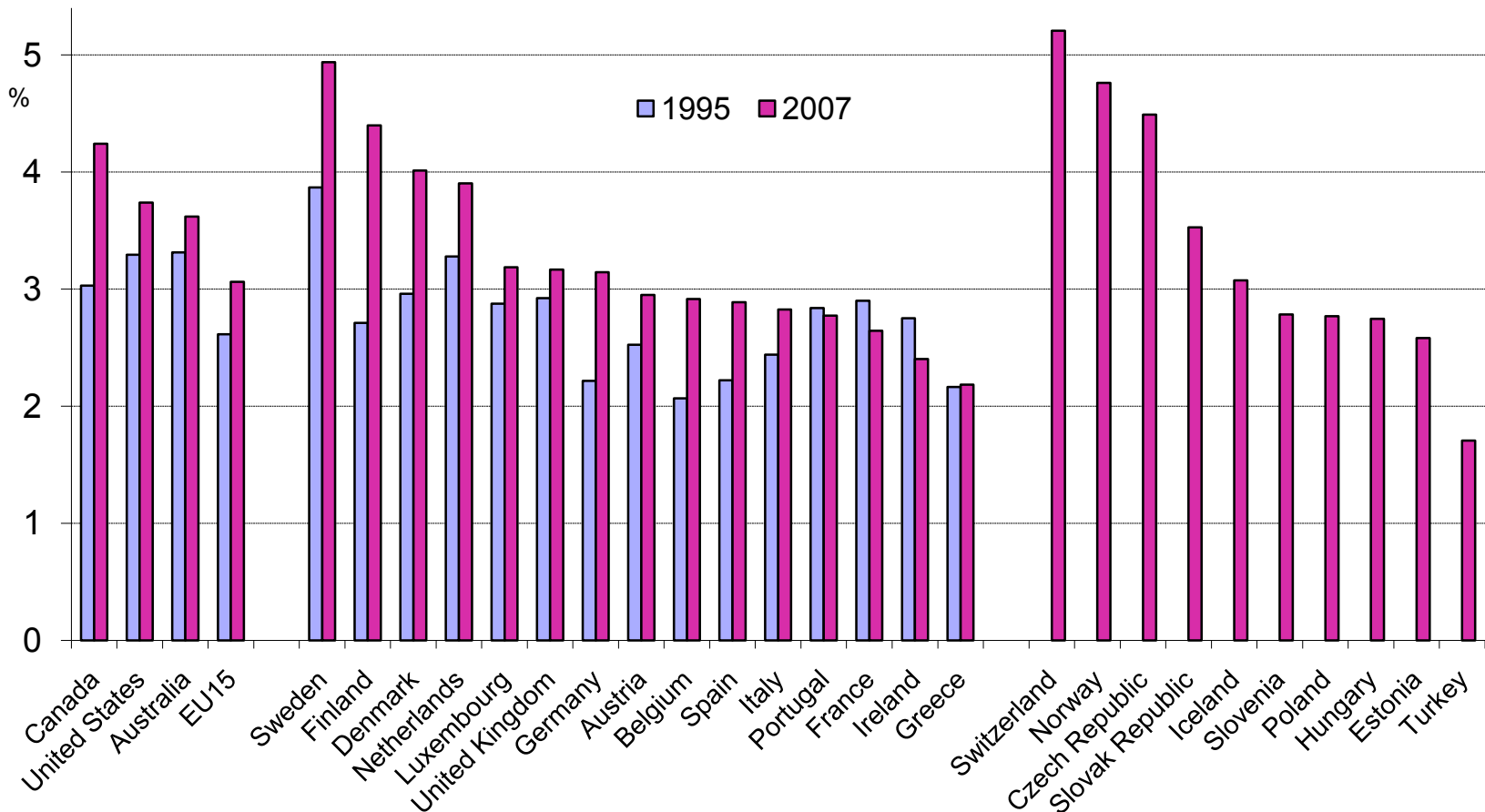
Wage Premium associated with ICT skills

Author	Country	Wage Impact (% increase over non-user)	
Krueger 1993	United States	1983	15.0
		1989	18.0
Boozer, Krueger and Wolkon 1992	United States		22-23
Hamilton 1997	United States		13-25
Handel 1999	United States		7
Krashinsky 2000	United States		0
Borland, Hirschberg and Lye 1999	Australia		10-18
Miller and Mulvey 1997	Australia		10-15
Reilly 1995	Canada		15.5
Morrisette and Drolet 1998	Canada		14
Entorf and Kramarz 1997	France		2-10
Entorf and Kramarz 1998	France		2-20
Entorf, Gollac and Kramarz 1999	France		1-18
Asplund 1997	Finland	1987	8.4
		1989	8.1
		1991	6.4
		1993	0
Dinardo and Pischke 1997	Germany		17
Haisken-DeNew and Schmidt 1999	Germany		1-7
Oosterbeek 1997	Netherlands		11
Arabsheibani, Emami and Marin 1996	United Kingdom		20-23
Arabsheibani and Marin 2000	United Kingdom		19
Bell 1996	United Kingdom		13
Green 1998	United Kingdom		13-18
Borghans and Ter Weel 2000a	United Kingdom		21
Sakellariou and Patrinos 2000	Vietnam		10-14

Source: Chris N. Sakellariou & Harry A. Patrinos (2003), Technology, Computers, and Wages: Evidence from a Developing Economy

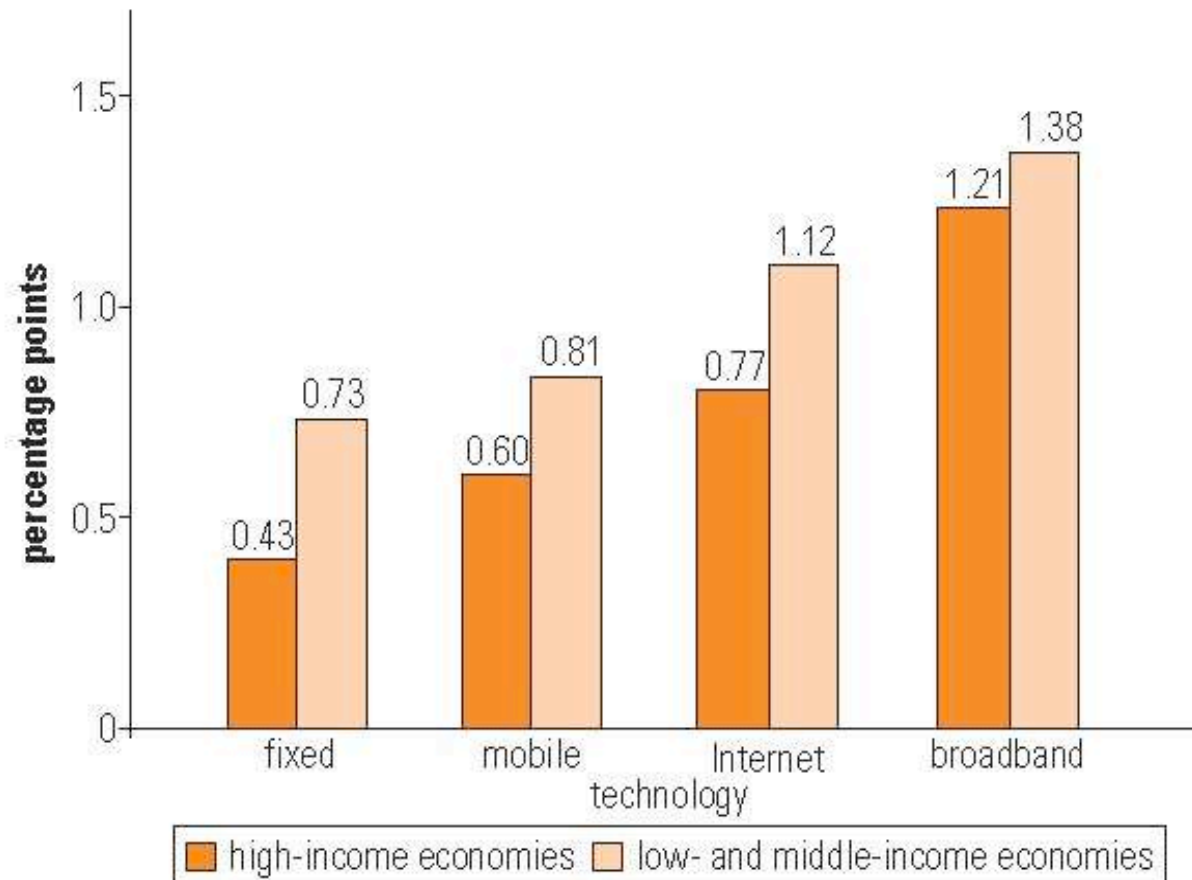
ICT Employment

Share of ICT specialist occupations in the total economy,
1995 and 2007



Source: OECD (2008), OECD Information Technology Outlook 2008

Economic Growth Effects of ICT

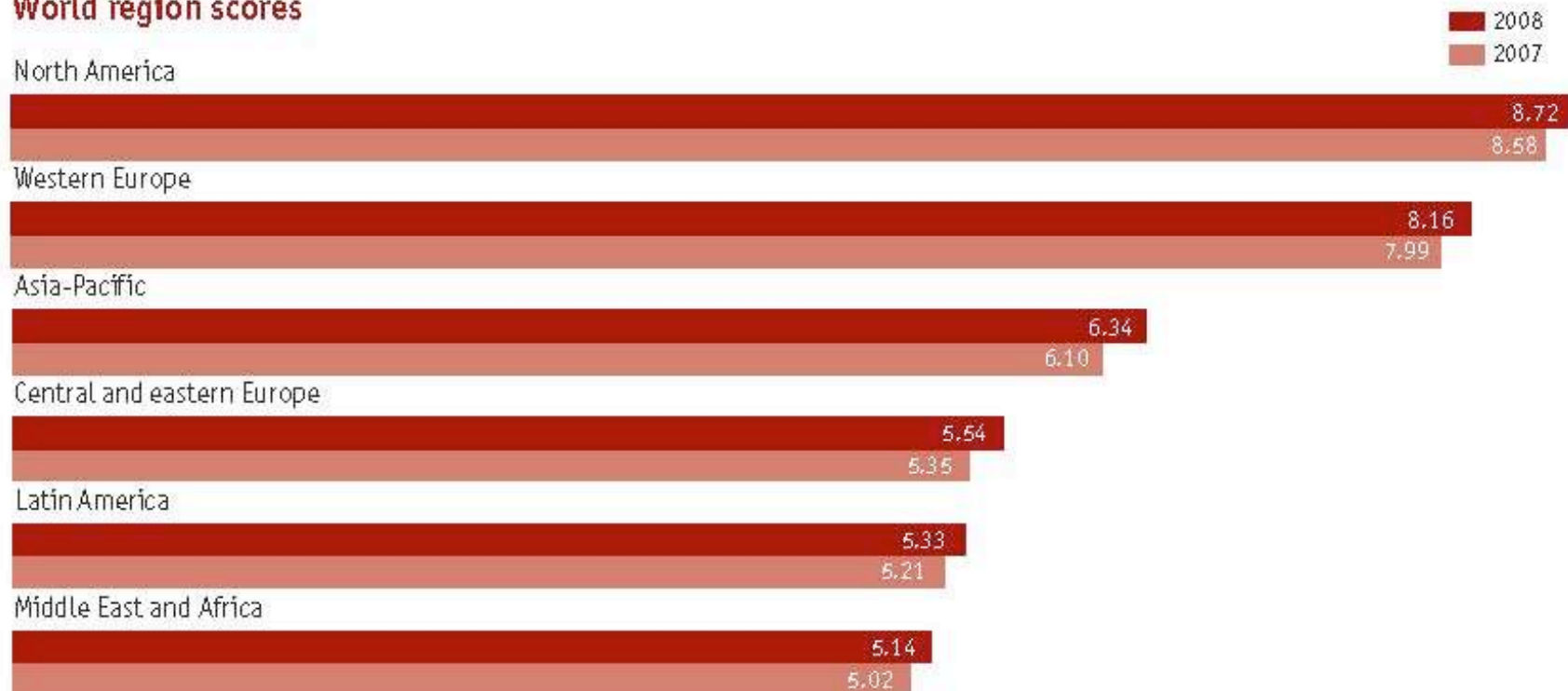


Source: World Bank (2009), Information and Communications for Development 2009

Where do we stand in terms of ICT?

E-Readiness World Region Score

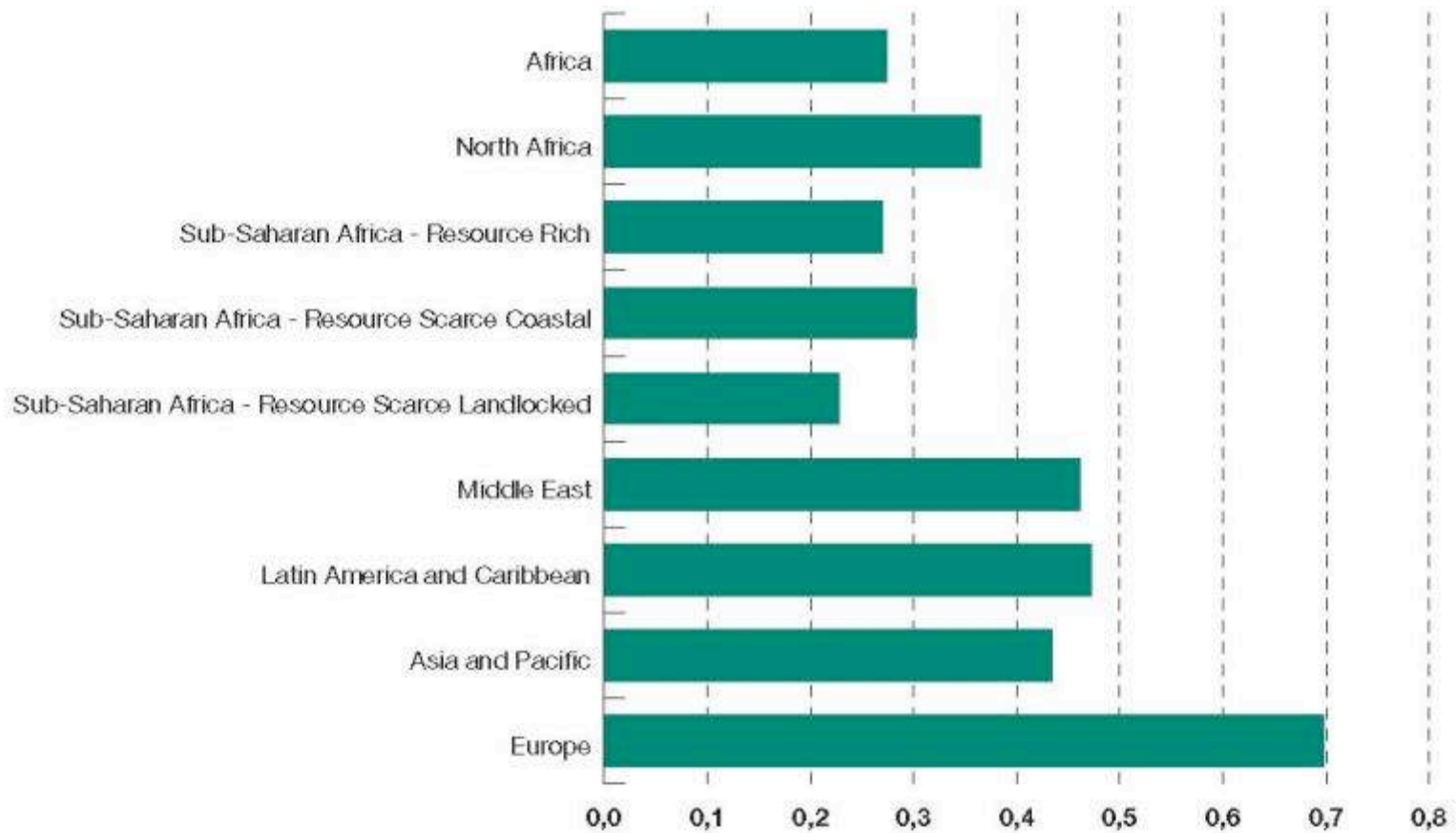
World region scores



Each region's score is based on the e-readiness scores for each of that region's countries covered in our rankings.
Source: Economist Intelligence Unit, 2008.

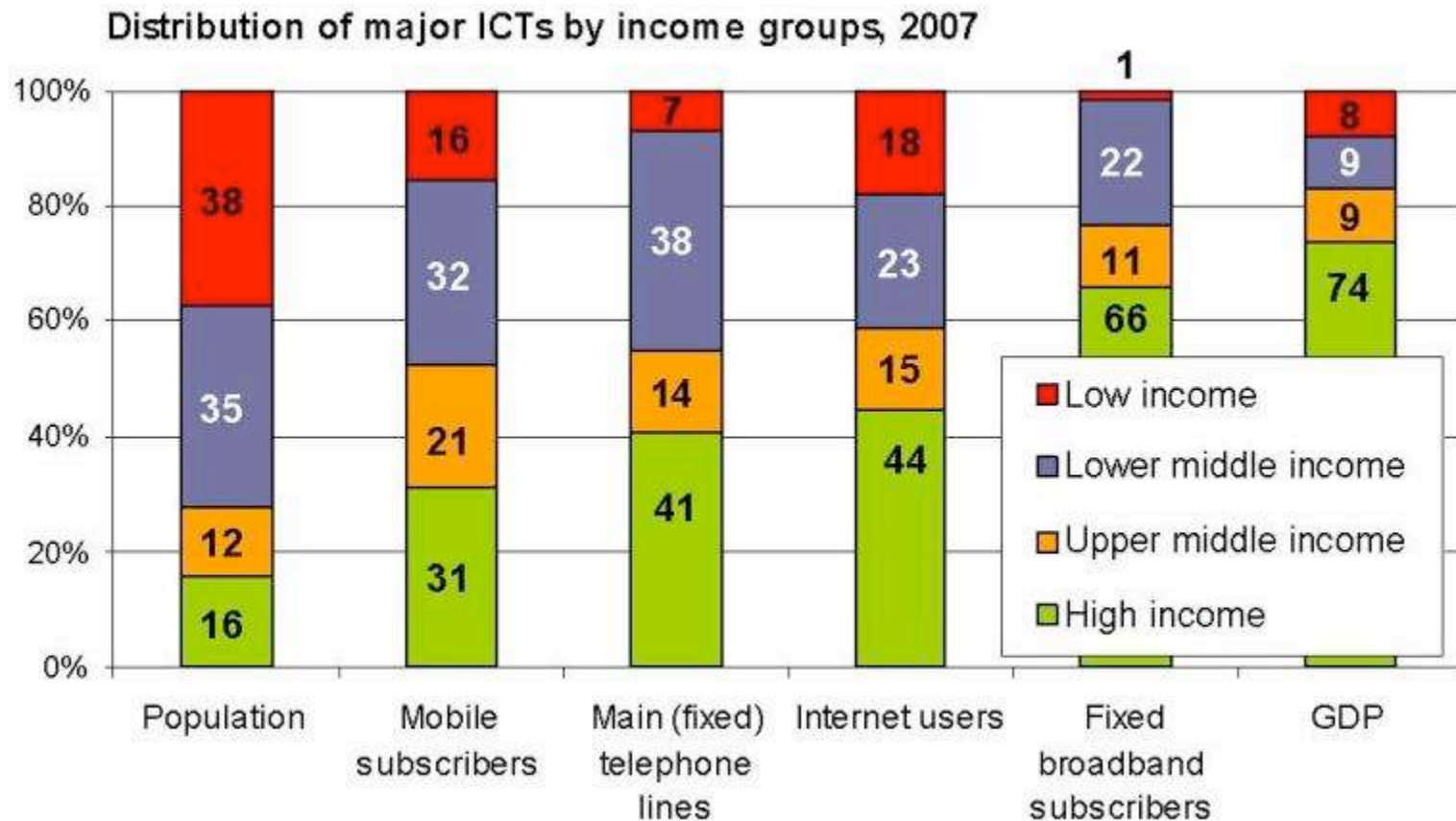
Source: The Economist Intelligence Unit (2008), E-readiness rankings 2008

UN E-Readiness Indicator 2008



Source: United Nations (2008), "The United Nations E-Government Survey 2008: From E-Government to Connected Governance," United Nations Press.

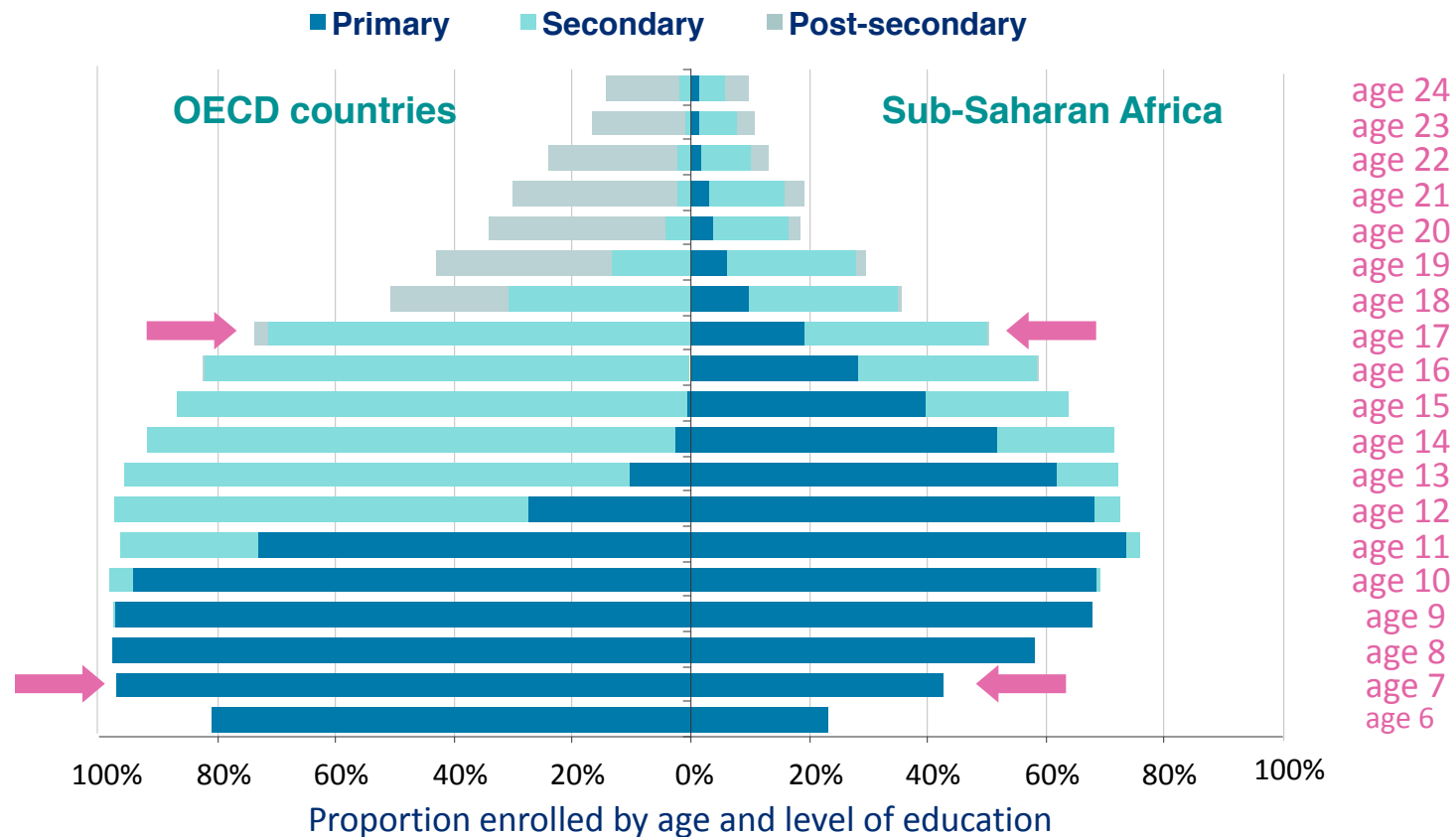
Persistent Digital Divide: by National Income Levels



Source: ITU (2008), Report on the World Summit on the Information Society Stocktaking

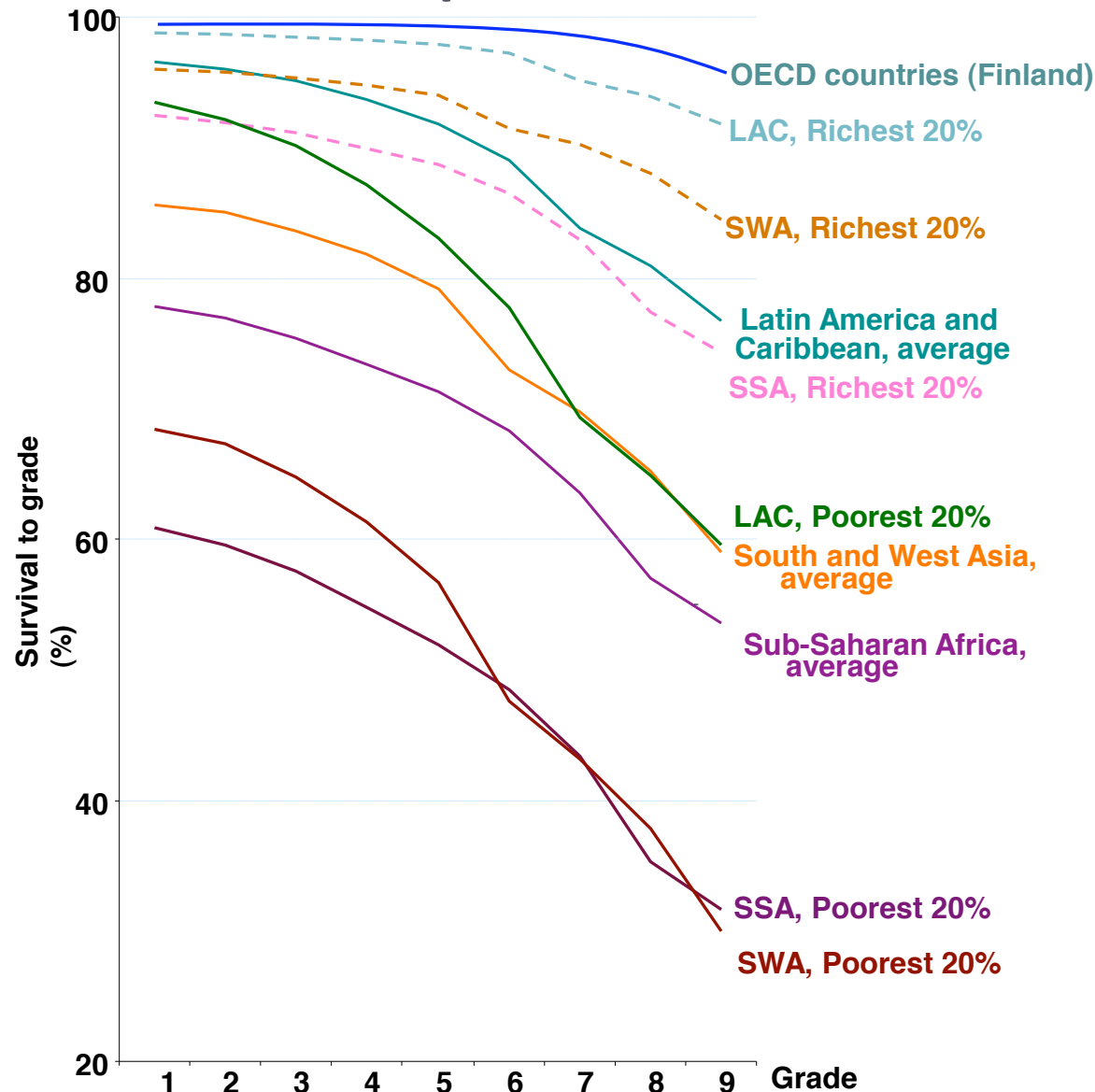
Where do we stand in terms of education attainment?

Global Divide between the world's richest and poorest nations



Source: UNESCO (2008), EFA Global Monitoring Report 2009

Wealth Gap: within countries



**Grade Attainment
by wealth quintile
in sub-Saharan
Africa, South and
West Asia and
Latin America and
the Caribbean**

Source: UNESCO (2008), EFA
Global Monitoring Report 2009

Taken Together

- Chances/opportunities for leapfrogging
 - Use of ubiquitous technology applications: Wireless connections, mobile devices, mobile phones, game machines, digital television, electric home appliances, and digital cameras
- Risk of lagging further behind
 - ICT becomes indispensable
 - Virtually all countries invest in ICT in education

II. Key Policy Questions

Q1. Does ICT increase access to learning opportunity?

- Education opportunities in dispersed locations where conventional schools are not viable;
- A choice to students and parents of what they want to learn;
- A safety net for school drop-outs so they do not lapse into illiteracy;
- Alternative venue to schools and;
- Second chance education

Case from India: National Open School

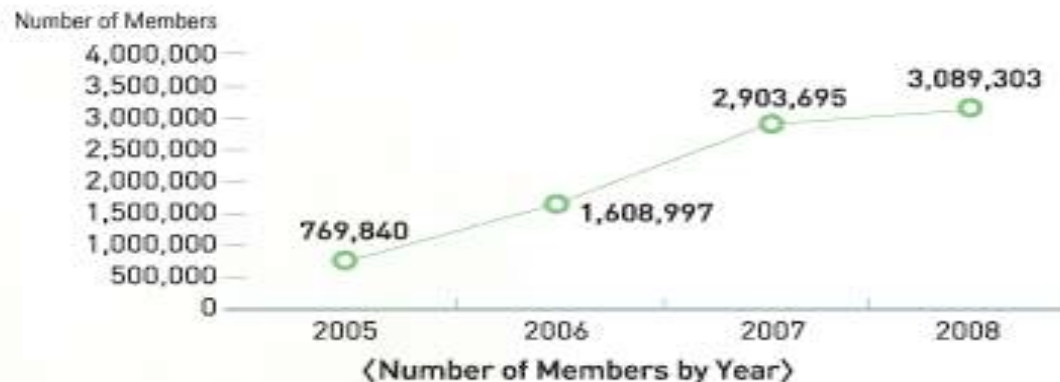
- Largest open school in the world in terms of enrollment, programmes and courses offered and the geographical area in the secondary level
- Network of 13 regional centers and more than 1,400 study centers spread all over India
- Offers secondary & senior-secondary courses
- During 2007-08 admission year, 340,342 students enrolled, 28.96% (sec.) and 36.69% (sr. sec.) certified

Case from Korea: Cyber Home Learning System

- Cyber Home Learning System (CHLS) and Educational Broadcasting Service (EBS) for economically and geographically disadvantaged students
- PC support project for low-income families
- 17 Cyber Universities for adults to promote lifelong learning

(As of August, 2008
unit : Person)

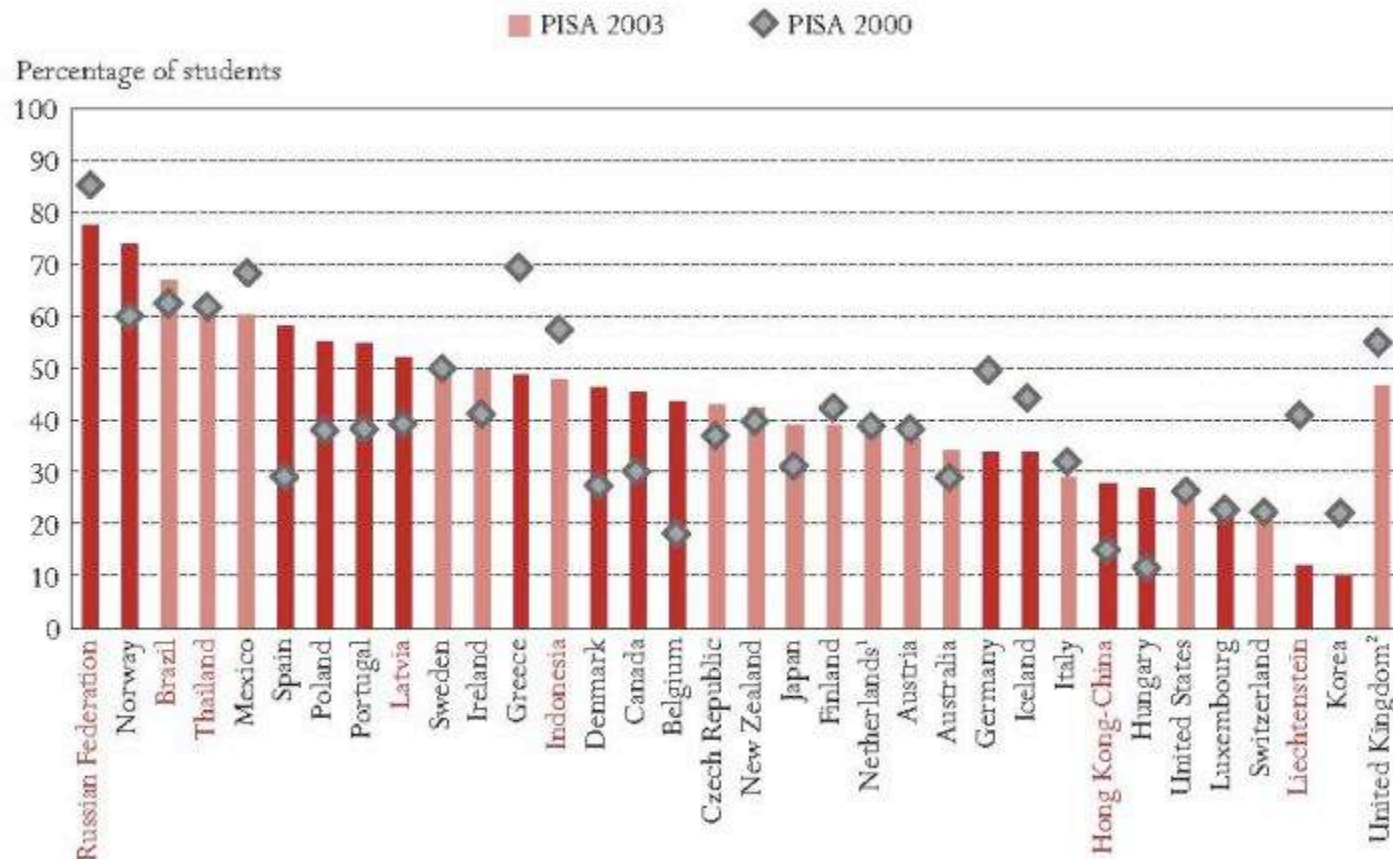
Description	Total No. of Members (Acc.)	No. of Cyber Teachers	No. of Parent Tutors	Average No. of daily visits
Total	3,089,303	60,891	4,508	304,236



Source: KERIS (2007), Research into the effectiveness and benefits of Cyber Home Learning System in 2007

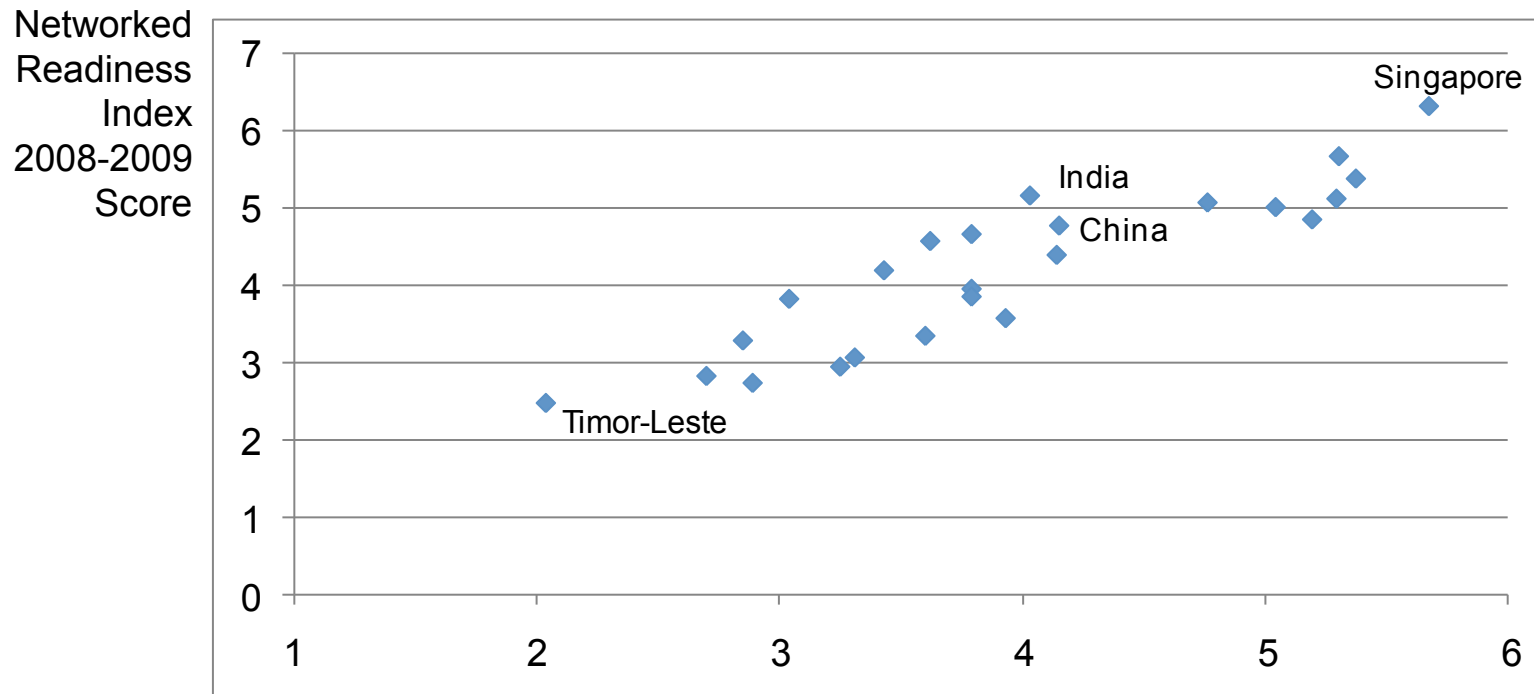
Q2. Does ICT promote student learning?

Percentage of students in schools whose principals report that instruction is hindered by shortage of computers for instruction



Source: OECD(2006), Are Students Ready for a Technology-Rich World? What PISA Studies tell us

Networked Readiness and Quality of Math and Science Education in AP

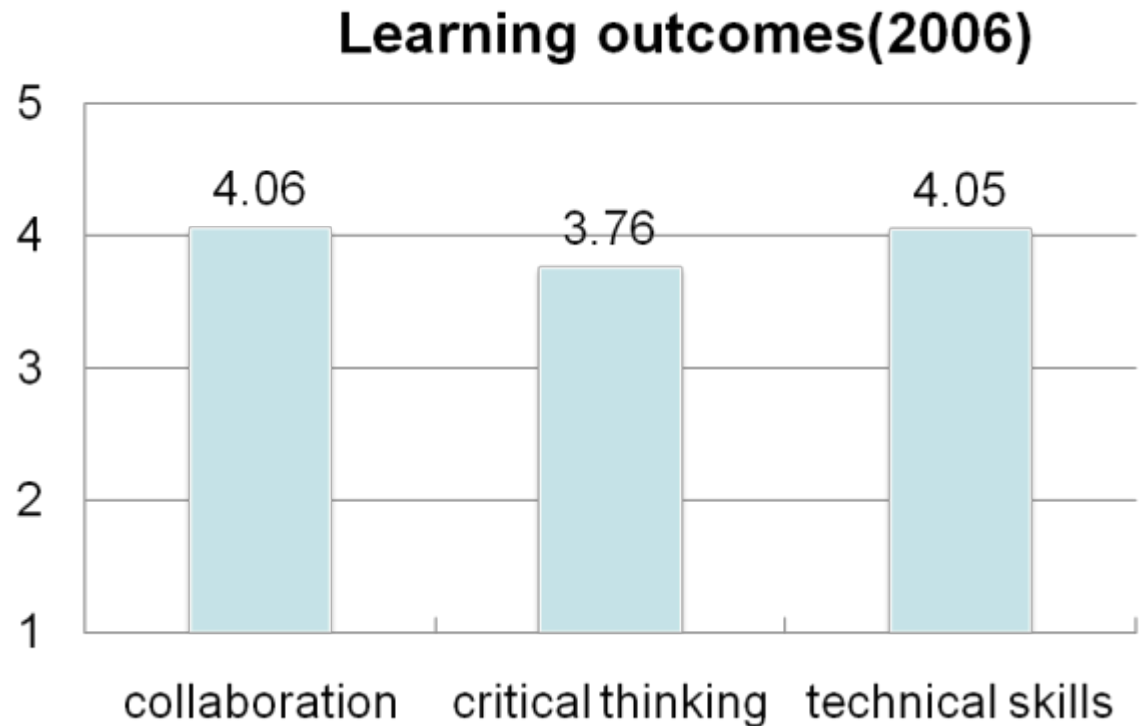


Math and science education in your country's schools (1 = lag far behind most other countries' schools, 7 = are among the best in the world)

Source extracted from: World Economic Forum (2008), Executive Opinion Survey 2007

Results of Intel “LEARN PROGRAM”

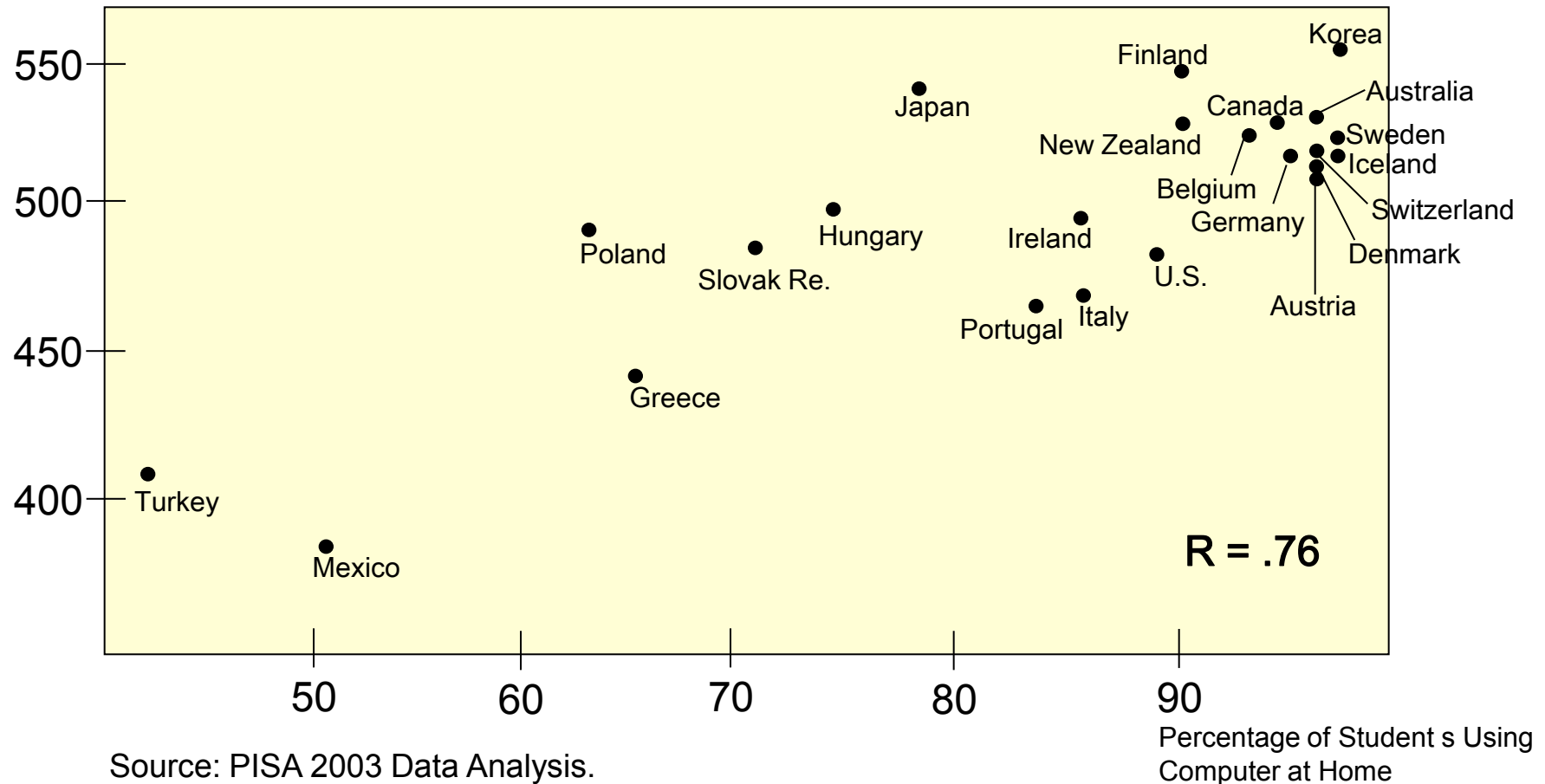
- **Target**
children & communities
that have limited access
to technology
- **Curriculum**
to design, create and
solve problems in
collaboration with peers in
order to gain new
knowledge
- **Implementation** 422,000
children in 9 countries



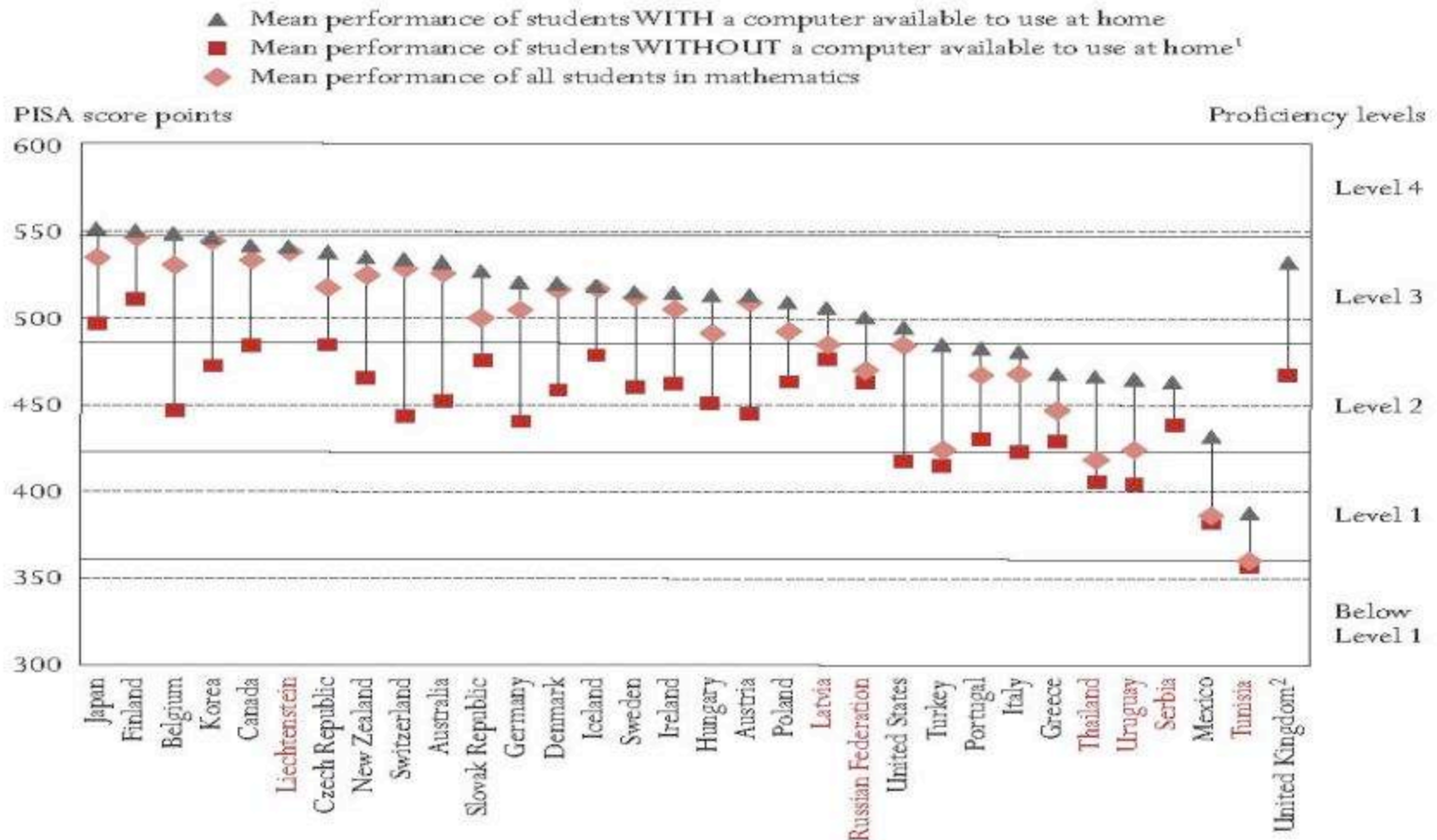
Source: Intel LEARN PROGRAM Evaluation Findings (2007)

Access to ICT and Student Achievement

Achievement of Problem Solving

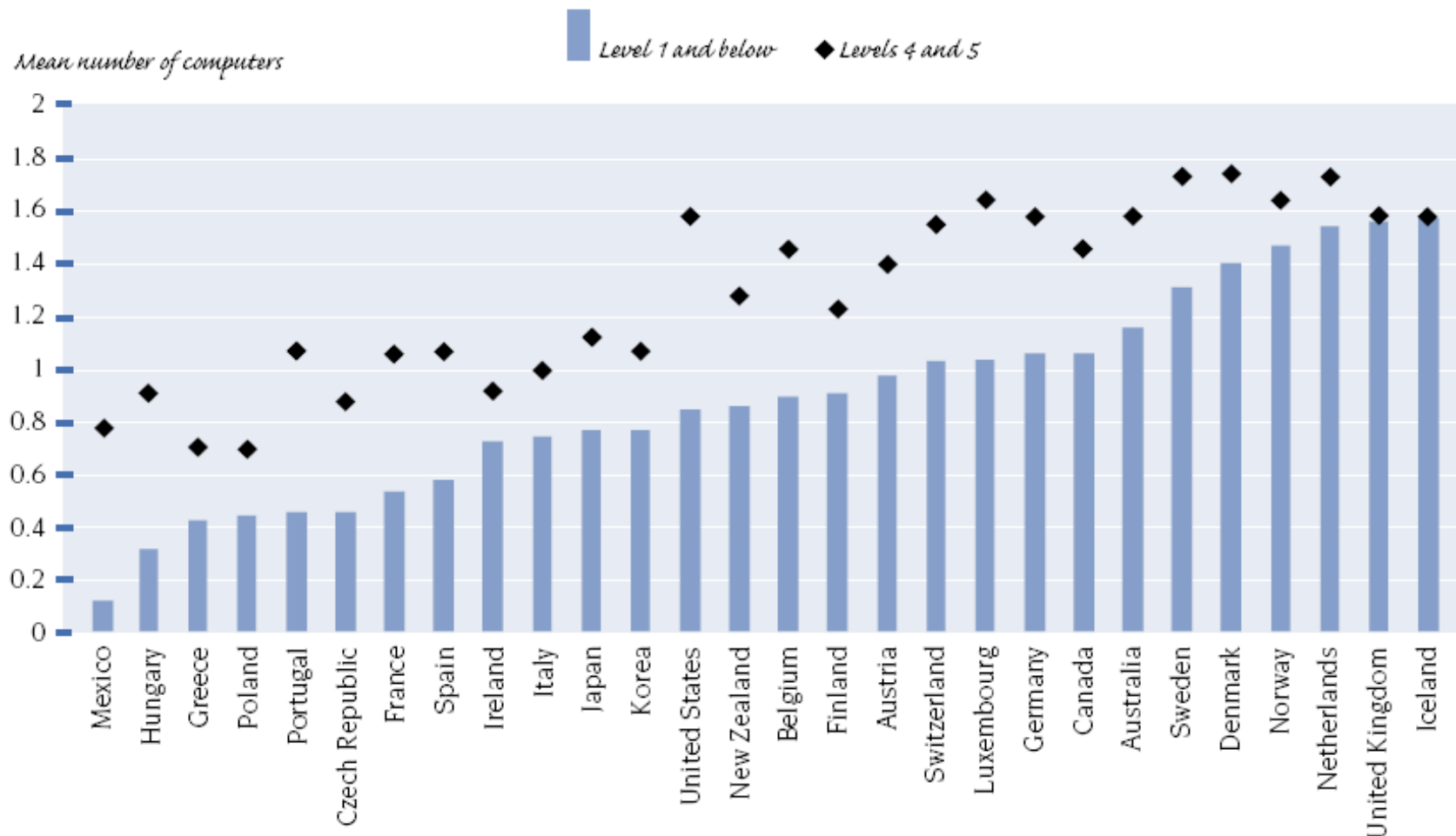


Availability/use of computer and student achievement in math



Source: OECD(2006), Are Students Ready for a Technology-Rich World? What PISA Studies tell us

Average number of computers at home of the lowest and highest achievers



Source: PISA database.

Q3. To what extent can ICT be a solution for better educational management?

- National/systematic level
 - Establish a comprehensive e-government project to enhance efficiency and quality of general civil services (procurement, service delivery, monitoring and evaluation, etc.)
- Local level
 - Share data and information among education administration organizations and other government departments
- School level
 - Handle education administration in a more efficient, convenient, and innovative way

ICT Leadership Training of Australia & New Zealand

- **Project** : Leadership Strategy – Learning in an ONLINE world

- **Purpose**

Development and application of school-based and systemic leadership to support the seamless integration of ICT in 21st century learning environment

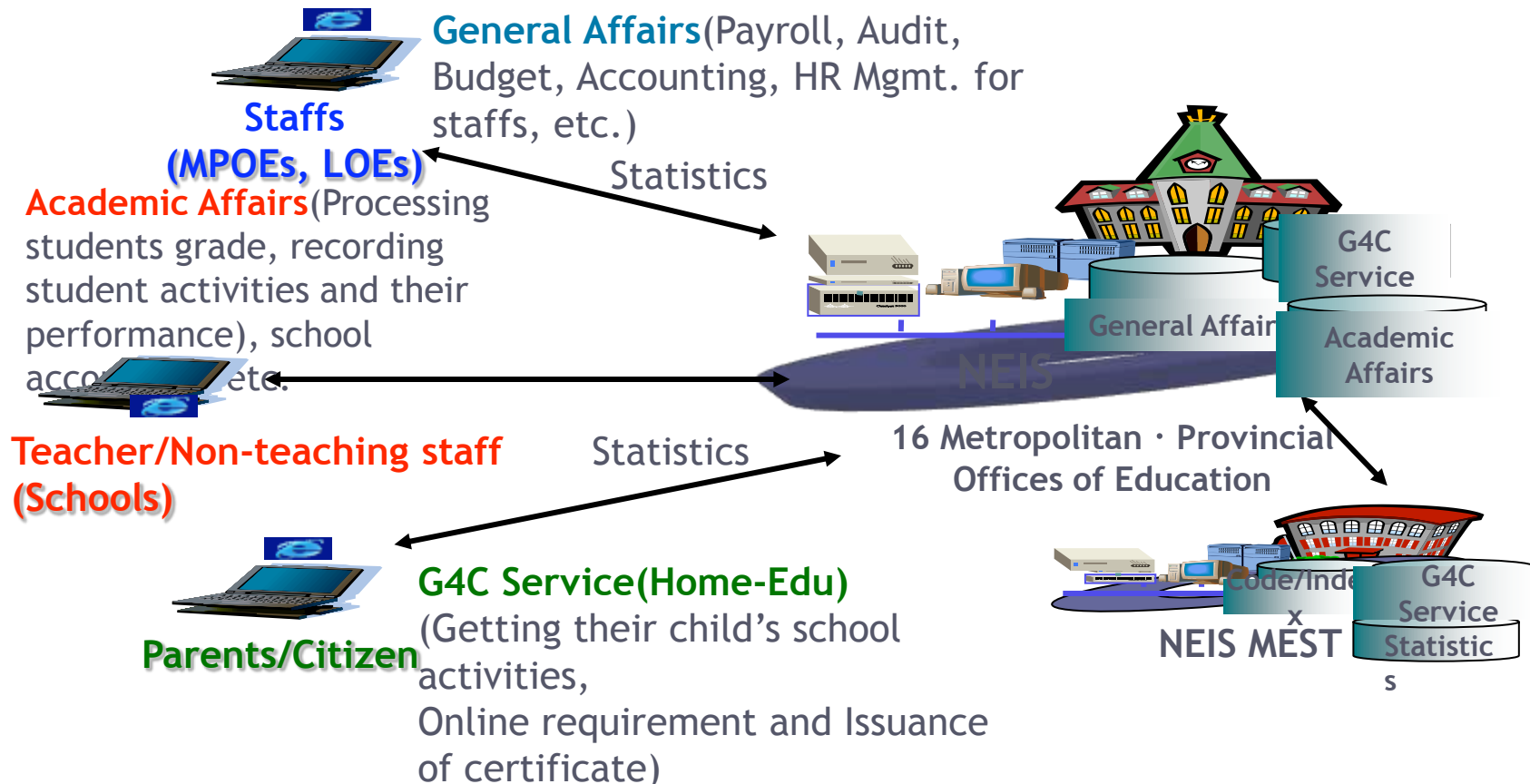
- **Main Contents**

mentoring programs for students, staff and community	defined standard and effectiveness measures for online and blended learning	online teaching, learning and assessment resources, programs, tools and service
online professional learning and leadership programs based on an audit of capability	video conferencing, pod-casting and audio data conferencing	data analysis in monitoring school achievement and setting targets
electronic reporting to students, parents, and systems	security and safety policies and procedures protecting students and staffs	governance and administration processes with transparent accountabilities

Case from Korea: NEIS

- National Education Information System
- Web-based online administration system for educational administration

Concept of NEIS Service

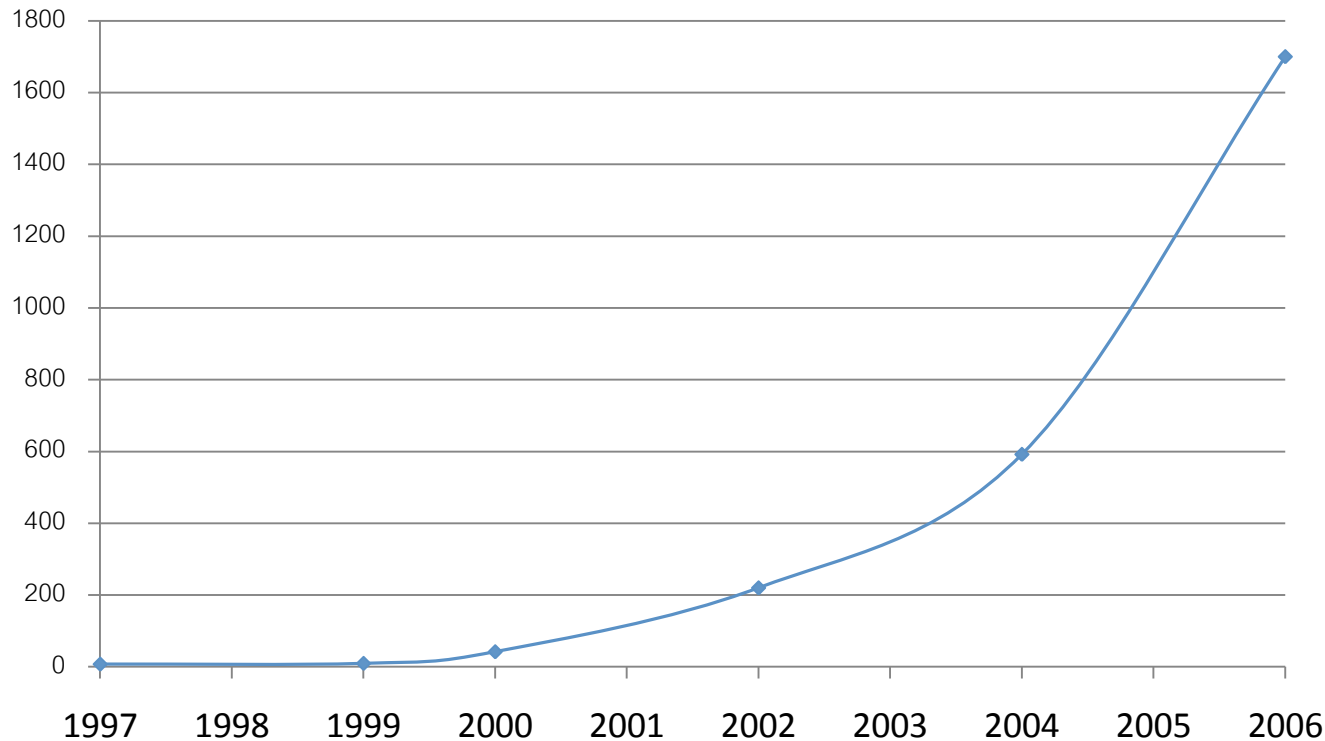


Q4. How do we sustain investment in ICT?

- ICT, one of the most important pillars of a global knowledge-based society, will play a key role in improving education and economy
- ICT technology – a push and pull between H/W and S/W – is constantly changing, a certain percentage of ICT devices and software should be replaced/upgraded every year

Rapid Technical Development

Number of transistors on a chip (in millions)



Source: OECD (2008), Trends Shaping Education

Case from Korea: Mobilization of Financial Resources

- **Diversify financial resources** including special tax, public & private funds, tax reduction to related industries
- **Strengthen cooperative mechanism** among the ministry of education, Metropolitan/Provincial Offices of Education and private partners
- **Examine multi-year budgeting system** to raise the efficiency of financial investment and to guarantee long-term perspective because a single year framework cannot suffice

Source: KERIS (2006), Analysis of ICT in Education Budget (2001-2005) and ways to reform in Korea

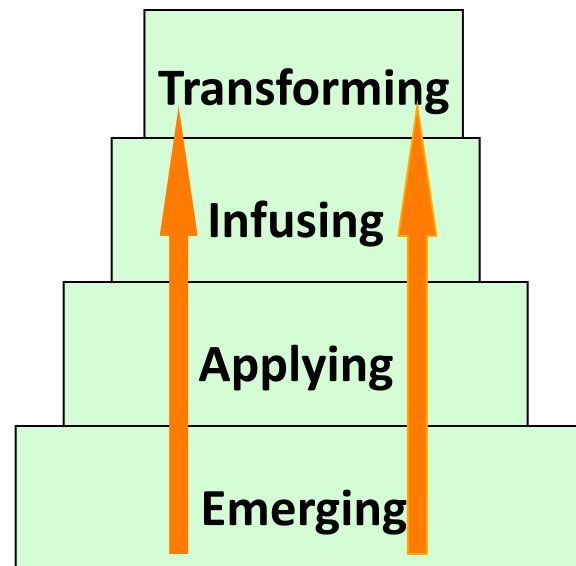
III. UNESCO's Work

Focus Area in ICT in Ed of UNESCO

- Standard Setting
 - Policy dialogue
 - Technical assistance in making masterplan
 - ICT in Education Indicators
- Capacity Building
 - From policy makers, teacher trainers, to master teachers
 - From individual to institutional capacity
- Catalyst for International Cooperation
 - ICT for Literacy Education
 - ICT in non-formal Education (Community Multimedia Centers)
- Laboratory of Ideas
 - ICT in Higher Education, e.g., Researches on the employability of IT graduates
- Clearing House
 - Research & Knowledge Sharing

Standard Setting

- ***A Regional ICT Competency Standard for Teachers*** to support member states' standard development
- ***A Regional Guideline*** on Teacher Development for ICT-Pedagogy Integration to guide teachers' development through the four-stage pyramid of ICT-pedagogy integration

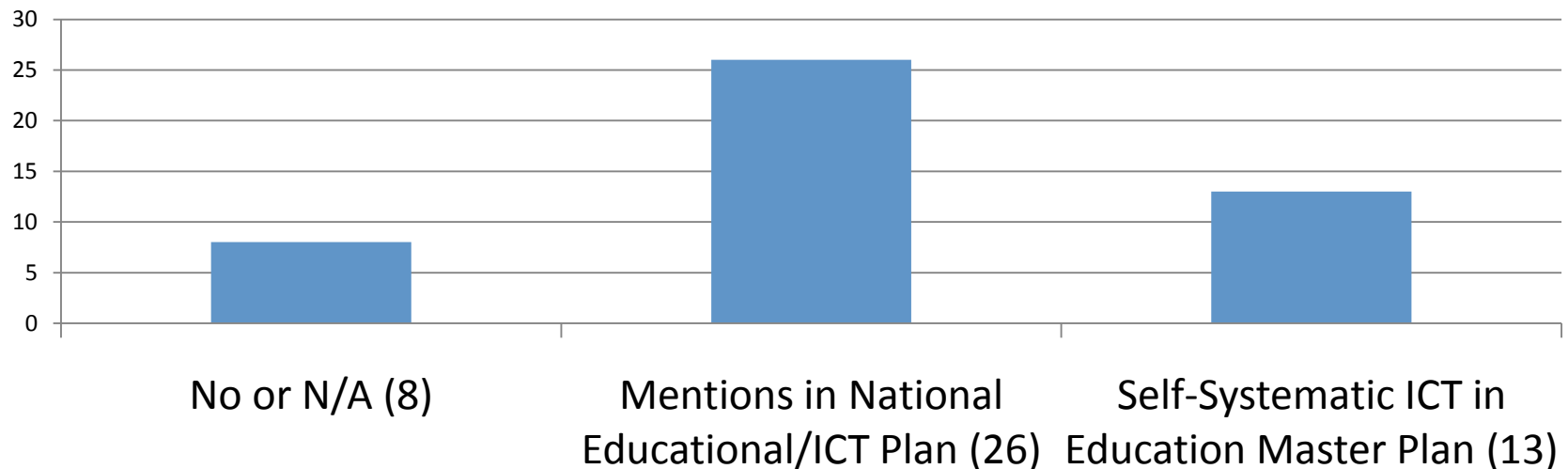


(a) Stages of ICT usages

(b) Pedagogical Usages of ICT

Current Situation on ICT in Education Master Plan in Asia-Pacific as of 2009

- A survey based on literature review and field visits
- Developed countries and emerging economies of this region (e.g., China, Malaysia, Thailand, Vietnam), and some developing countries (Cambodia, Sri Lanka) have complete and systematic ICT in education master plans
- Most Pacific & Central-Asian countries do NOT have or no literature available



Capacity Building I - Building national capacity in ICT in education policy planning

- ICT in Education Policy Toolkit in collaboration with World Bank (www.ictinedtoolkit.org)
- More than 400 policymakers of 29 countries trained
- Assisted Cambodia, Sri Lanka develop National ICT in Education Master Plans. Discussing with Bangladesh



Capacity Building II – Developing institutional capacity of teacher education institutions (TEI)

- Next Generation of Teachers Project :
 - Target more than 50 of TEIs of 16 countries (Bangladesh, Brunei, Cambodia, China, India, Indonesia, Laos, Malaysia, Mongolia, Nepal, Philippines, Sri Lanka, Thailand, Uzbekistan, and Vietnam)
 - Three-pronged approach: Deans' Forum (institutional leadership), Curriculum Development, and Training of Trainers

Capacity Building III – Building individual capacity of key actors

- Training of trainers and master teachers: National Workshops on ICT-pedagogy Integration for 13 countries and over 400 teacher educators trained
- Development of E-learning modules
 - ICT in ED Essentials and ICT in Education Decision-Making
 - South-South Cooperation Project
 - Development of training modules and supporting materials
 - Online learning modules
 - Online forum

Catalyst for International Cooperation

- High-level ICT in Ed Seminars for education leaders in cooperation with World Bank
- ICT for Literacy Education in cooperation with five Field Offices
 - To promote the use of ICT (mobile phones) for literacy education of adult illiterates in five countries: Bangladesh, China, India, Indonesia, and Pakistan

Clearing House

- ICT in Education Website
 - No. 1 in Google Search Engine with key term of “ICTinED”
- e-Newsletter
 - Published every 2-3 weeks and auto-sent to over 4500 global subscribers
- Print publications and CD-Roms
 - Over 30 publications produced, and about 4000 copies sent to over 500 distinctive recipients
- Online Community:
www.unescobkk.org/forum/education/ict
- Awards on ICT in Ed Innovative Practice
 - Three categories: teachers & teacher educators, education planners & managers, non-formal educators

IV. The Way Forward

- Building national capacity in evidence-based ICT in education policy planning and implementation
- Promoting policy dialogue, knowledge sharing, and innovation dissemination
- Monitoring the progress of using ICT to promote education quality
- Fostering North-South-South co-operation and public-private partnership

Thank You!

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